

DENTAL INSERTS FOR TREATMENT OF PERIODONTAL DISEASE

FIELD OF THE INVENTION

The present invention relates to methods and articles for treating periodontal disease. More specifically, the present invention relates to methods and articles to inhibit incursion of epithelium and to enhance healing of periodontal defects with the placement of absorbable inserts between the teeth and gingiva. Most specifically, the present invention relates to methods and articles for improving the inserts emplaced between teeth and gingiva for inhibiting incursion of epithelium and to enhance healing of periodontal defects.

BACKGROUND OF THE INVENTION

During the early stages of periodontal disease, known commonly as gingivitis, bacteria on the teeth and near the gingiva infect and irritate the sulcus where the gingiva approximates the tooth. The presence of bacteria can lead to destruction of the gingival epithelium which connects the gingiva to the tooth and can force the epithelium to separate from the root of the tooth. Also, as a result of bacterial presence, inflammatory cells increasingly populate the gingival tissues. Thus, the tissue is weaker due to the disease, and attachment is lessened. Of course, further infection moves the tissue attachment further toward the apex of the tooth, creating a pathological pocket much deeper than the normal sulcus.

Naturally, this pocket is difficult to clean or floss because the routine cleaning instruments of normal home care cannot reach the bacteria or plaque which accumulate within the pocket. As disease extends the pocket, the periodontal ligament which attaches the tooth to the supporting bone, and the supporting alveolar bone itself, are destroyed. This disease leaves a periodontal defect, filled with plaque and bacteria. Ultimately, the tooth could be surrounded by loose, diseased, and detached gingiva. Eventually such deterioration can result in the loss of the tooth.

One conventional treatment of periodontal defects consists of surgically gaining access to the root surface in an effort to remove bacteria and possible infected soft tissue and to alter the periodontal pocket or obtain reattachment of the connective tissue toward the crown of the tooth. Some of the former methods accomplish such attachment by cutting away gingival tissue near the crown of the tooth and if necessary shaping underlying bone to create a sulcus similar in depth to a normal sulcus so that regular oral hygiene may be used to maintain attachment of the gingiva to the tooth. Of course, such treatment does not recreate the attachment of the gingiva near the crown such as existed before any diseased condition. Such treatment also does not replace any periodontium lost to disease.

Another conventional treatment is known as a gingival flap procedure. One or more flaps of gingival tissue are retracted from the tooth. After the root is thoroughly cleaned, and diseased soft tissue is removed, these flaps are reopposed to the tooth. In some instances gingival grafts from other portions of the mouth are incorporated. Reattachment is unpredictable using this procedure. Gingival epithelium migrates rapidly along a tooth route toward the apex of the tooth, and bone cementum, and periodontal ligament migrate much more slowly. If the gingival epithelium is allowed to

migrate toward the base of the periodontal defect, the gingival tissue is said to undergo a process called repair. The more desired process would allow the bone, cementum, and periodontal ligament cells to migrate coronally; this process is called regeneration. Repair is simply healing but regeneration is healing of the defect with the return of the defect towards the original condition.

Methods used to enhance the attachment of periodontal ligament to the tooth have usually tried to exclude gingival tissue from a healing defect site. For instance, the tooth surface has been etched with acids as some researchers have attempted to cause connective gingival tissue to attach to the tooth in order to stop the migration of the gingival epithelium toward the root. Other researchers have attempted to fill the defects with bone or artificial bone substitutes so that the bone portion of the defect may heal despite rapid growth of epithelium toward the root.

In other treatments, foils or other membranes into which gingival tissue cannot penetrate are used to separate the gingival tissue from the healing defect. In such a method, the epithelium migrates along one side of the membrane while the defect heals through ligament reattachment on the opposite side of the membrane.

These previous attempts to correct periodontal defects have not provided for attachment of periodontal ligament to the tooth while controlling the migration of the epithelium toward the root of the tooth. For this reason these techniques have met with quite limited success. In a most ideal case, periodontal disease should be treated by obtaining attachment of periodontal ligament to the tooth which will halt migration of the epithelium near the level maintained before the disease, and not more toward the apex of the tooth. In this case, the defect apical to the gingival attachment is healed by periodontal tissue which exists under the gingiva during the absence of periodontal disease.

One such method of causing such prevention of apical migration of gingival epithelium is to involve the placement of semipermeable or semiporous constructions between the tooth surface and the gingival tissue in an area in which periodontal disease has caused the attachment of the epithelium to the tooth to migrate toward the root of the tooth. Such a construction will not allow tissue to pass, but permits nutrients to pass between the tooth and gingiva. Upon placement of this construction against a portion of the perimeter of the tooth surface, the gingival tissue is positioned around the tooth, resulting in the construction being located between the gingival tissue and the tooth. During healing, the construction halts the apical growth of gingival epithelium so that periodontal ligament can healthily form, and is ready for attachment upon removal of the semiporous construction barrier.

These dental implants have taken on many forms. Some of the earlier forms of such dental implants were made from polytetrafluoroethylene (PTFE), a biocompatible but not bioabsorbable substance. Dental implants using PTFE gingival implant capably guarded against the apical migration of epithelium tissue while allowing the proper healing of periodontal ligament within the periodontal defect.

However, such dental implants have their own drawbacks. Specifically, a PTFE implant must necessarily be removed. Removal requires a subsequent surgical procedure which has proved inconvenient from the pa-